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Document Number 3

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File: DWPI

Sep 18, 1991

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TITLE: In-situ monitoring of surface moisture of moving coffee beans - measuring ratios of intensities of reflected infrared light of different wavelengths

INVENTOR: RAPP, W

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PRIORITY-DATA:

1990DE-4008279

March 15, 1990

PATENT-FAMILY:

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<u>EP 446794 A</u>	September 18, 1991	N/A	000	N/A
DE 4008279 A	January 9, 1992	N/A	000	N/A
DE 4008279 C	May 14, 1992	N/A	005	G01N021/85
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EP 446794 B1	May 18, 1994	G	008	G01N021/85

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APPLICATION-DATA:

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EP 446794A	March 8, 1991	1991EP-0103540	N/A
DE 4008279A	March 15, 1990	1990DE-4008279	N/A
DE 4008279C	March 15, 1990	1990DE-4008279	N/A
DE59101628G	March 8, 1991	1991DE-0501628	N/A
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DE59101628G	N/A	EP 446794	Based on
EP 446794B1	March 8, 1991	1991EP-0103540	N/A

INT-CL (IPC): A23F 5/04; G01N 21/31; G01N 21/55; G01N 21/84; G01N 21/85;
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ABSTRACTED-PUB-NO: EP 446794A

BASIC-ABSTRACT:

In-situ monitoring of surface moisture of moving coffee beans during

roasting involves illuminating them with at least two different infrared wavelengths as they pass a viewing window.

The reflected light intensity is measured continuously and the ratio of the intensities compared with a reference value to determine the degree of roasting. When a certain degree of roasting is reached the beans are moistened with a defined quantity of water. A further wavelength indicating absorption in water is then used to determine the surface moisture level.

USE/ADVANTAGE - Enables accurate monitoring of surface water moisture and termination of roasting when required moisture level is achieved.
ABSTRACTED-PUB-NO:

EP 446794B

EQUIVALENT-ABSTRACTS:

Method of monitoring in situ the surface humidity of moving coffee beans during their roasting process the coffee beans moving rapidly past an observation window of a roasting furnace during the roasting process and being illuminated thereby a slight source containing at least two different infra-red wave-lengths, which both exhibit no absorption in water, the intensities of said wavelengths, which are reflected by the surface of the coffee beans, being continuously measured the quotient from both intensities being used to determine the actual degree of roasting which is compared with a colour standard at regular intervals of time, and the coffee beans being moistened with a predetermined quantity of water after the predetermined degree of roasting has been achieved, characterised in that the intensity of an additional infra-red wavelength, which is reflected by the coffee beans, which are to be roasted and move rapidly past the observation window, and which wavelength exhibits absorption in water, is continuously measured during the roasting process, the quotient from this intensity and from one of the reflected intensities of the other wavelengths, which are not absorbed in water, is used to determine the superficial humidity on the surface of the coffee beans during the roasting process, after the predetermined degree of roasting has been achieved, water for moistening purposes is added to coffee beans, which continue to move rapidly in the roasting furnace, in dependence on the degree of roasting and the existing measured surface humidity, the quotient of the intensities of the wavelength exhibiting an absorption in water and of the one wavelength exhibiting no absorption in water is continuously formed and used in an attached computer to monitor and control the addition of water for moistening purposes, a colour change in the moving coffee beans, caused by the humidification, is correctively compensated-for in the computer, whereby a trial roasting of a change of coffee beans becomes superfluous.

DE 4008279C

For in-situ monitoring of the surface moisture of coffee beans in motion during roasting, the beams are illuminated through a window by a light source contg. at least two different infrared wavelengths which are not absorbed by water.

Reflected intensities are continuously measured along with that of an infrared wavelength showing absorption in water. Quotients of reflected intensities are used to show surface moisture and, after the required degree of roasting is achieved, water is added. Quotient of intensities of water-absorbed wavelength and non-absorbed wavelength is continuously formed for use in a computer to monitor and control water addn.

ADVANTAGE - Accurate water additions can be made.

CHOSEN-DRAWING: Dwg.1/3 Dwg.1/3

TITLE-TERMS:

MONITOR SURFACE MOIST MOVE COFFEE BEAN MEASURE RATIO INTENSITY REFLECT
INFRARED LIGHT WAVELENGTH

DERWENT-CLASS: S03

EPI-CODES: S03-E04A9; S03-E04H; S03-E14A;

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